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Lesson 4 Inline Images & Colors

Lesson Topics

- ▶ Inline Images
- ▶ GIF vs. JPEG: Which Format to Use?
- ▶ Incorporating Inline Images
- ▶ Background Images & Colors
- ▶ Lesson 4 Summary

Inline Images

One of the most appealing characteristics of Web publishing and HTML is the ability to incorporate images into Web documents to produce more visually appealing Web pages. These images, called *inline images*, allow HTML authors to create pages with rich page design and layout.

Web browsers are capable of displaying three image file formats:

- GIF (Graphics Interchange Format), DOG.GIF
- JPEG (Joint Photographic Experts Group), DOG.JPG
- PNG (Portable Network Graphics), DOG.PNG

GIF Image Format

The GIF image file format (pronounced “jif”) is the most common image format found on the Internet. Introduced by CompuServe Inc. in 1987, the GIF format has gained popularity because the size (byte count [as opposed to pixel dimensions]) of GIF images is smaller than that of other image formats. There are two versions of the GIF format:

- 87a
- 89a

What makes the GIF image format smaller than other image file formats is the fact that it is an inherently compressed file format. Any graphics application or Web browser capable of opening and displaying GIF images has a built in GIF decoder that first decompresses the GIF image. The application then displays the decompressed GIF file.



The GIF 89a format, a more robust and capable format, is preferred over the 87a format. For more information regarding Web graphics, see DDC’s *Creating Web Graphics* course.

When stored, on a computer hard drive or other storage device (floppy disk, CD-ROM, etc.), GIF images are always in compressed form. GIF images are decompressed only for actual display or editing.

A downside of the GIF format is that it supports a maximum color depth of only 256 (8 bit). On the upside, however, GIF supports transparency (whereas JPEG does not), allowing GIF images to integrate seamlessly with colored and patterned backgrounds.

JPEG Image Format

The JPEG image format (pronounced “jay peg”) has become increasingly popular with the growth of Web publishing. Although similar to the GIF format, the JPEG format has one distinct advantage over GIF: it can handle a maximum color depth of 16.7 million (24 bit).

The JPEG image format, like GIF, is an inherently compressed file format. JPEG images, however, offer greater compression ratios than GIF. Therefore, an image in JPEG format is smaller (requires less storage volume) than the same image in GIF format.

Lossy Format

The disadvantage of the JPEG format is that it is a lossy image format, meaning that the JPEG compression algorithm “loses” the quality of an image when it is converted to JPEG. However, the reduction in image quality is not very noticeable to the human eye because patches of similar colors are converted to a single “average” color. Because the human eye is more sensitive to variations in image *brightness* than variations in image *color*, it is tricked into thinking the compressed JPEG image is nearly identical to the original, non-compressed image (that resides in a different format than JPEG).

PNG Image Format

PNG (pronounced “ping”), or *Portable Network Graphics*, is a newcomer to the world of Web graphics formats. In 1998, the W3C¹³, the premier standards body for the Web, released a specification recommendation for the PNG format. This format was hailed as a replacement for both GIF and JPEG images.

PNG is well suited for *both* graphics and photo-realistic images. This is a distinct advantage over GIF, which is better at representing graphics with large blocks of the same color (such as line art and cartoons). PNG is also superior to JPEG, which is better for photo-quality images with high color variance.

Advantages of PNG

PNG offers many advantages over the GIF and JPEG formats. Among these are 10-30% better *lossless* compression than GIF (depending on the composition of each particular image), 24-bit and 48-bit true color support (superior to JPEG, but creates images typically too large for the Web), two-dimensional interlacing for progressive display (current standards offer only one-dimensional interlacing), and 254 levels of alpha channel transparency (GIF offers only two levels of transparency).

¹³ You can learn more about the W3C and its Web initiatives and standards at www.w3.org.

Disadvantages of PNG

Despite its advantages and overall superiority as a Web graphics format, PNG does have some disadvantages. PNG is not commonly used because it is only supported by more recent versions of major Web browsers. If your organization has standardized on a browser that supports PNG images, you can use PNG images on your intranet. At this time, it is not recommended that you use PNG images on an external Web site due to still significant numbers of people still using versions 3.0x and older of both major browsers.

Support for PNG images has been included in the following browser versions:

- Netscape Navigator 4.04 and more recent
- Microsoft Internet Explorer 4.0b1 (beta 1) and more recent

Never Completely Replace GIF

Even if the PNG format does become the default graphics and image file format of the Web and HTML, GIF will not become extinct. This is because PNG does not support animation. Thus, HTML scripters must continue using animated GIFs to place animation on their Web pages (or the PNG format will need to be revised to include animation capabilities). For a complete review of GIF animation, see DDC's *Creating Web Graphics*.

Comparing GIF, JPEG, & PNG

Users viewing Web pages are completely unaware of the format of the images they are seeing. However, it is important for you, as a Web publisher, to be very familiar with the characteristics of both image formats and to know the circumstances under which one format is more appropriate than the other.

Table 4-1 compares the characteristics of GIF, JPEG, and PNG image formats.

Attribute	GIF	JPEG	PNG
Maximum Color Depth	256	16.7 million	16.7 million+
Image Transparency	Yes (two levels)	No	Yes (254 levels)
Lossy Compression Scheme	No	Yes	No
Size of a 1153 KB BMP (bitmap format) photo-realistic image file when converted to...	300 KB	48 KB	764 KB

Table 4-1: GIF, JPEG, and PNG image formats compared

GIF vs. JPEG: Which Format to Use?

Knowing the differences between the GIF and JPEG formats is important when deciding which format you should use for the image on your Web page. You should base your format choice on the type of graphic or image you plan to use.¹⁴



Choosing between the GIF and JPEG format is not a question of “which format is better?”; it is a question of which format is best suited to handle the particular characteristics of an individual image.

The JPEG format was created for full-color (often called *true color*) or grayscale photo-realistic images. Scanned photographs and Kodak Photo CD images (files with a PCD file name extension) should be saved in JPEG format. Technically, any image with a large degree of color variance (typical of photo-realistic images) is best stored in the JPEG format.

The GIF image format, although capable of storing photo-realistic images not exceeding 256 colors in depth, is best for storing images with large areas of solid colors, such as clipart, cartoon-like images, and logos. Icons and bullets are typically comprised of few colors and little variation and thus are best stored in the GIF format.

Table 4-2 lists common image applications and the formats best suited to them.

Image Type	GIF	JPEG
Line drawings / clipart	✓	⊗
Cartoons & cartoon-like images	✓	⊗
Most non-photo-realistic images	✓	⊗
Images with a small number of distinct colors or shades of gray	✓	⊗
Photo-realistic color images	⊗	✓
Photo-realistic grayscale images	⊗	✓
Images intended to have greater than 256 colors or shades of gray	⊗	✓

Table 4-2: Comparison of GIF and JPEG format uses

¹⁴ The PNG format has been excluded from this overview; it will be added when it becomes common.

Image Format Conversion

A plethora of freeware, shareware, and commercial graphics software is available for the purpose of converting an image that is improperly formatted. Whether the image should be converted to a different format, however, is determined, in large part, by its present format.

JPEG to GIF Only

Because JPEG is designed to handle images with greater than 256 color depth, converting a 256-color (or fewer) GIF image to JPEG format is not always a good idea. When converted to JPEG format, the image will remain 256 colors in depth; converting to JPEG does not mean that the number of colors in an image will increase. In extreme cases, images are the same size or *larger* after being converted from GIF to JPEG.

JPEG to GIF file conversion, however, is typically a safe path to follow. Remember that the image will automatically be dithered to only 256 colors when converted to GIF.

Conversion is simple and problem-free when you begin with a file in its original format (TIFF, EPS, BMP, PCD). Thus converting to either GIF or JPEG can be accomplished with no risk of image corruption and maximum compression of the file.

Image Conversion Rules

Observe the following rules when converting images between formats:

- Non-photographic images should generally be left in GIF format;
- Never convert black-and-white images (grayscale) from GIF to JPEG;
- When possible, use an original file for conversion to the desired destination format. "Original" formats include BMP, PCD, TIFF, EPS, and PSD.



Inline images with a color depth greater than 256 should rarely be used, especially in Web pages to be posted on an external Web server. Such images impose a bandwidth burden on dial-up modem clients attempting to download the pages containing the images. If scripting for an Intranet to which users are connected via speeds substantially higher than those of analog modems, true color images can be used.

Incorporating Inline Images

The Image tag, ``, is simply a pointer, or reference, to an image file. When a user downloads a Web page, the HTML script instructs the browser to: 1) perform a separate download for the image and to 2) display it in a particular manner in the browser.

Image Tag ``

The Image tag, ``, is an empty tag with five commonly used attributes, as shown in Table 4-3.

Attribute	Description	Values	Necessary?
SRC	Short for "source"; SRC is the URL of the image file. It provides the location of the image to the user's browser.	Complete or partial URL	Yes
ALIGN	Allows text to be wrapped around the image.	<ul style="list-style-type: none"> ■ left, center, right ■ top, middle, bottom 	No
ALT	Short for "alternate"; if a user has turned off the display of graphics in the browser, ALT provides text describing the image. The ALT information also appears in a popup window when a user hovers the mouse pointer over the image.	Any text string	No
HSPACE	Adds space to both the left and right of the image, as measured in pixels.	1-100 (pixels)	No
VSPACE	Adds space to the top and bottom of the image, as measured in pixels.	1-100 (pixels)	No

Table 4-3: Attributes associated with the `` tag



The ALT attribute requires text strings consisting of more than one word (separated by spaces) enclosed by quotation marks (ALT="Picture of German sports car").

Exercise 4-1: Adding an Inline Image

1. Switch applications to your text editor and open WEBPAGE.HTM (if necessary).
2. Type the following script that appears in bold:

```
<HR SIZE=4 WIDTH=50% ALIGN=left><P>
```

```
<IMG SRC=tractor.jpg ALT="Frost Farm in Bucyrus, Ohio">My trip to the  
farm<P>
```

3. Save the HTML document.
4. Switch applications to your Web browser.
5. Reload the Web page.
6. Move your mouse pointer over the image. Note the popup text that appears. This displays the value for the ALT attribute.
7. Compare the screen that is displayed in your Web browser with Figure 4-1. If they are not similar, repeat the steps of this exercise, taking care to accurately type the script in Step 2. Note that, by default, the image aligns at the bottom of the adjacent text.

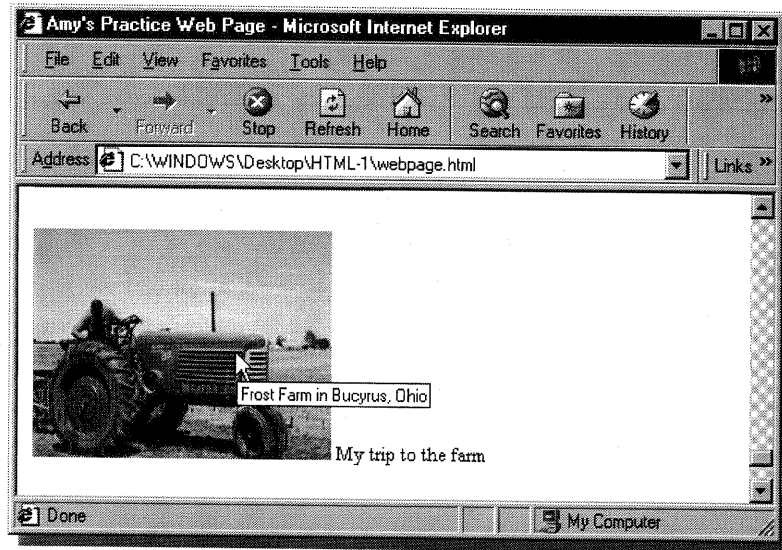


Figure 4-1: Inline image placed with the tag

Exercise 4-2: Aligning an Inline Image to Vertical Middle

This exercise, and those that follow, teach you how to align inline images with body text using the `ALIGN` attribute. The `ALIGN` attribute is useful for wrapping text around images. Exercise 4-6 and Exercise 4-7 show you how to create a bullet list using the `` tag as an alternative to using the `` list tag.

1. Switch applications to your text editor.
2. Edit the script you entered in Exercise 4-1 to appear as follows:

```
<IMG SRC=mailpouch.jpg HSPACE=20 ALIGN=middle ALT="Barn north of  
Waverly, OH on Rt. 23">My trip to Ohio<P>
```

3. Save the HTML document.
4. Switch applications to your Web browser.
5. Reload the Web page.
6. Compare the screen that is displayed in your Web browser with Figure 4-2. If they are not nearly identical, repeat the steps of this exercise, taking care to accurately type the script in Step 2.

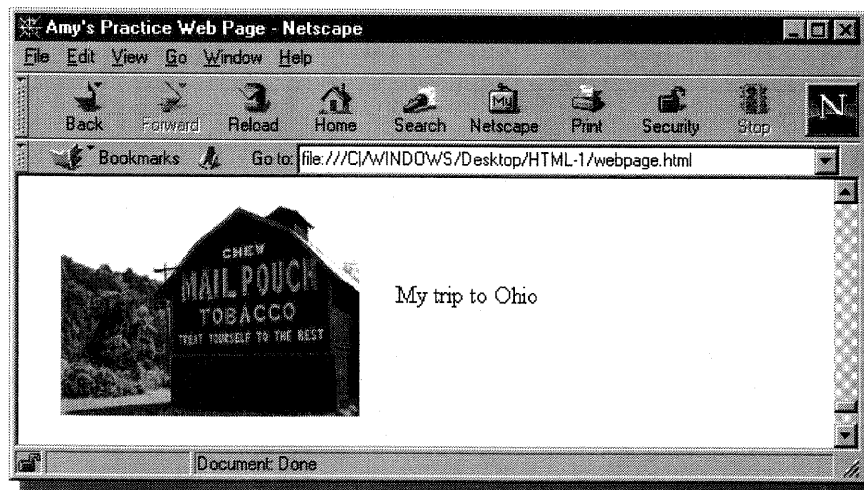


Figure 4-2: Inline image with `ALIGN=middle` and `HSPACE=20`

Exercise 4-3: Aligning an Inline Image to Vertical Top

1. Switch applications to your text editor.
2. Edit the script you entered in Exercise 4-2 to appear as follows:

```
<IMG SRC=mailpouch.jpg HSPACE=10 ALIGN=top ALT="Barn north of Waverly,  
OH on Rt. 23">My trip to Ohio<P>
```

3. Save the HTML document.
4. Switch applications to your Web browser.
5. Reload the Web page.
6. Compare the screen that is displayed in your Web browser with Figure 4-3. If they are not nearly identical, repeat the steps of this exercise, taking care to accurately type the script in Step 2.



Figure 4-3: Image with ALIGN=top and HSPACE=10 attributes

Exercise 4-4: Aligning an Inline Image to Horizontal Right

1. Switch applications to your text editor.
2. Edit the script you entered in the previous Image tag exercise to appear as follows:

```
<IMG SRC=mailpouch.jpg HSPACE=10 ALIGN=right ALT="Barn north of Waverly, OH on Rt. 23">My trip to Ohio<P>
```

3. Save the HTML document and switch applications to your Web browser.
4. Reload the Web page.
5. Compare the screen that is displayed in your Web browser with Figure 4-4. If they are not nearly identical, repeat Steps 2-4 of this exercise.

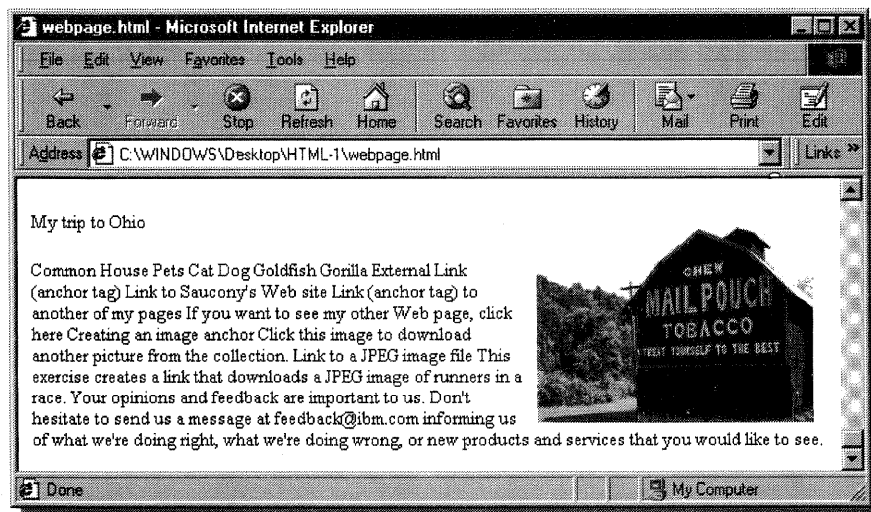


Figure 4-4: Inline image with ALIGN=right

6. Note the text that appears to the left of the image. There is an attribute to the
 tag that can force this text below the image.
7. Switch applications to your text editor.
8. Edit the script you entered in the previous Image tag exercise to appear as follows:

```
<IMG SRC=mailpouch.jpg HSPACE=10 ALIGN=right ALT="Barn north of Waverly, OH on Rt. 23">My trip to Ohio<BR CLEAR=all>
```

9. Save the file. Switch applications to your Web browser and reload the Web page.

10. Compare the screen that is displayed in your Web browser with Figure 4-5. If they are not nearly identical, repeat Step 9.

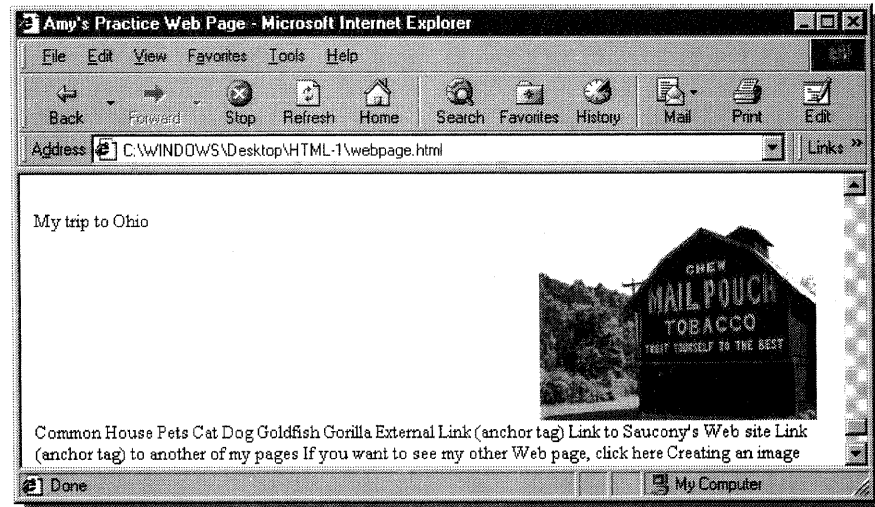


Figure 4-5: Text pushed below image with CLEAR=all attribute to the
 tag

11. Switch applications to your text editor.
12. Edit the script you entered in the previous Image tag exercise to appear as follows:

```
<IMG SRC=mailpouch.jpg HSPACE=10 VSPACE=15 ALIGN=right ALT="Barn north  
of Waverly, OH on Rt. 23">My trip to Ohio<BR CLEAR=all>
```

13. Resave the file. Switch applications to your Web browser and reload the Web page. Compare the screen that is displayed in your Web browser with Figure 4-6.

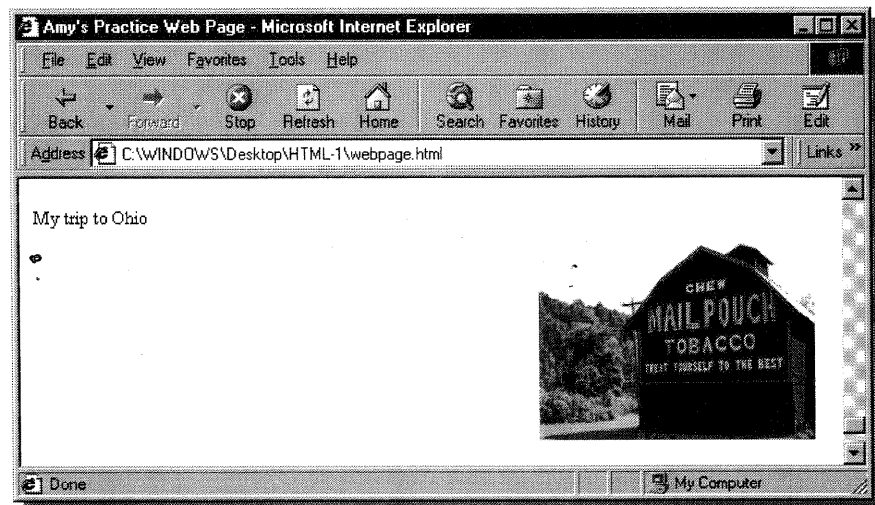


Figure 4-6: White space added below an image using the VSPACE attribute

Exercise 4-5: Horizontally Centering an Inline Image and Caption

1. Switch applications to your text editor.
2. Edit the script you entered in the previous exercise to appear as follows:

```
<CENTER>  
<IMG SRC=plane.jpg VSPACE=15 ALT="Andrews Air Force Base, Greenbelt,  
Maryland"><BR>The Air Show  
</CENTER><P>
```

3. Save the HTML document.
4. Switch applications to your Web browser.
5. Reload the Web page.
6. Compare the screen that is displayed in your Web browser with Figure 4-7. If they are not nearly identical, repeat the steps of this exercise, taking care to accurately type the script in Step 2.

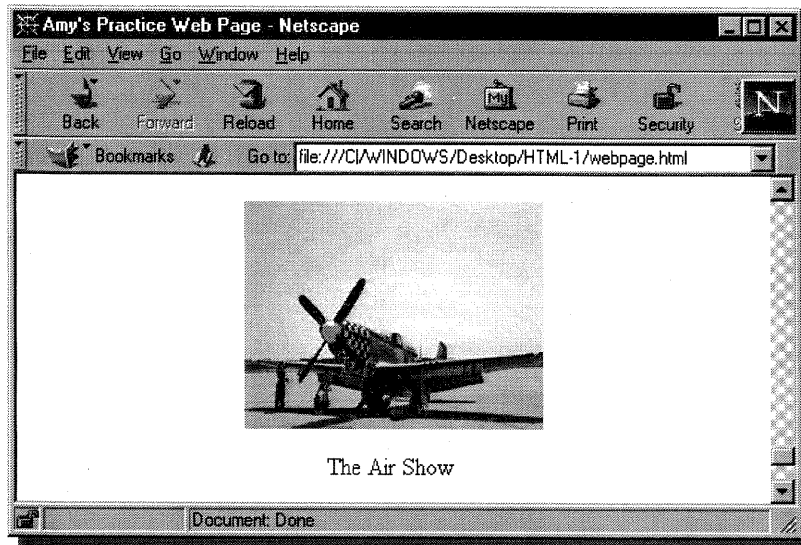


Figure 4-7: Inline image horizontally centered with the <CENTER> tag

Exercise 4-6: Creating a Bullet List with a GIF Image

1. Switch applications to your text editor. Open WEBPAGE.HTM, if necessary.
2. Add the bold script (as shown below) to the text on your screen:

```
<FONT SIZE=+2>Common House Pets</FONT><P>  
<IMG SRC=bullet.gif>Cat<BR>  
<IMG SRC=bullet.gif>Dog<BR>  
<IMG SRC=bullet.gif>Goldfish<BR>  
<IMG SRC=bullet.gif>Gorilla<P>  
  
<HR SIZE=4 WIDTH=50% ALIGN=left><P>
```

3. Save the HTML document.
4. Switch applications to your Web browser.
5. Reload the Web page.
6. Compare the screen that is displayed in your Web browser with Figure 4-8. If they are not nearly identical, repeat the steps of this exercise, taking care to accurately type the script in Step 2.

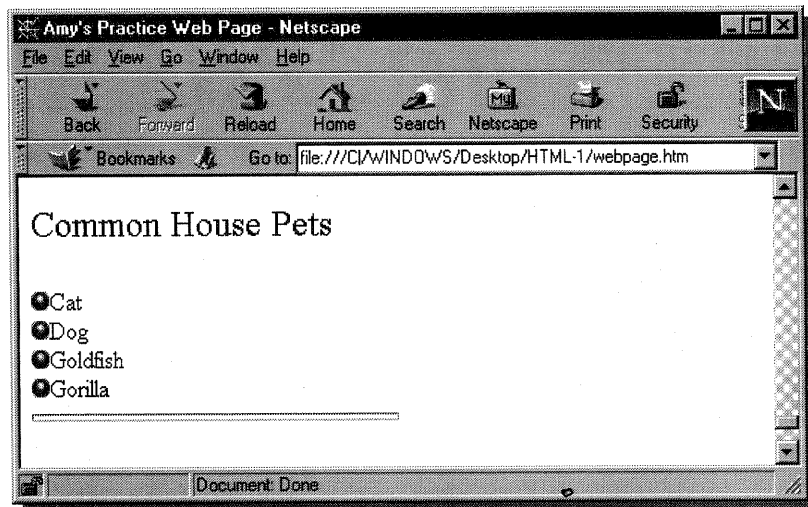


Figure 4-8: A bullet list created with an inline GIF image

Exercise 4-7: Refining a GIF Image Bullet List

1. Switch applications to your text editor.
2. Edit the GIF image bullet list script you entered in the previous exercise to appear as follows:

```
<FONT SIZE=+2>Common House Pets </FONT>

<BLOCKQUOTE>
<IMG SRC=bullet.gif HSPACE=6>Cat<BR>
<IMG SRC=bullet.gif HSPACE=6>Dog<BR>
<IMG SRC=bullet.gif HSPACE=6>Goldfish<BR>
<IMG SRC=bullet.gif HSPACE=6>Gorilla<P>
</BLOCKQUOTE>
```

3. Save the HTML document.
4. Switch applications to your Web browser.
5. Reload the Web page.
6. Compare the screen that is displayed in your Web browser with Figure 4-9. If they are not nearly identical, repeat the steps of this exercise, taking care to accurately type the script in Step 2.

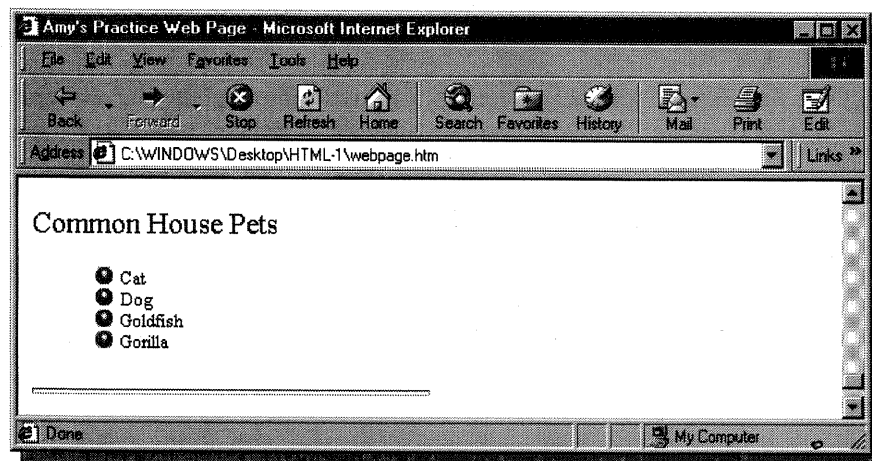


Figure 4-9: A refined GIF image bullet list

7. Compare Figure 4-8 with Figure 4-9. Note that the HSPACE attribute to the tag added space between the bullet images and the adjacent text.

Background Images & Colors

You can easily enhance your Web pages using background images and colors. While easy to apply, such effects are often “overdone,” distracting to users, or simply tacky.

Background Images

HTML allows a GIF or JPEG image to be used as a background “pattern” in a Web page. Users with large monitors running high resolution video drivers will see many more replications of the pattern than those with small monitors running at low resolution.

To fill the screen, the image is replicated to create the illusion of a cohesive background. This repeating pattern of the image file is called *tiling*. Once an image is designated by the HTML scripter, the browser automatically tiles it to form the background image.

Syntax

To designate a background in HTML, you use an attribute to the <BODY> tag. The background attribute is `BACKGROUND=image filename`. To prevent losing your image files, you should archive the background image file in the same directory as your HTML documents.



It is typically good practice to use the same background on all the pages of a Web site. Different backgrounds on different pages of the same Web site may lead a user to believe that he has linked to a different Web site.

Not all images are suitable for background images and some may not be appropriate for the content of your Web page. When deciding on a background, you face two major challenges:

- finding an image that looks natural when tiled
- finding an image that contrasts well with body text and other page elements

A common mistake made by HTML scripters when including a background image in their Web pages is a lack of contrast between the background and the page text. Without such contrast, text will be difficult to read, thus decreasing the value of the Web page.



“Trying to fix HTML is like trying to graft arms and legs onto hamburger.”

— Ted Nelson, *inventor of hypertext*, 1998

Background Colors

For a simpler look, solid color may be specified as a background, rather than an image. Both background colors and text colors are specified using *RGB¹⁵ codes*. See Appendix D: *RGB Color Codes* for a complete list of RGB codes.

```
<BODY BGCOLOR=#RGB code>
```



For better contrast, when using darker background colors, change text color to a lighter color, such as white, cream, or yellow.

Text Colors

Text colors are specified with the TEXT attribute to the <BODY> tag. The same RGB codes used for background colors are used for TEXT values.

```
<BODY TEXT=#RGB code>
```

Table 4-4 lists the RGB codes for some popular colors. Note that an RGB code must always be preceded by a pound sign (#).

Color	RGB Code
Black	#000000
Blue	#0000FF
Gold	#CD7F32
Green	#00FF00
Gray	#C0C0C0
Orange	#FF7F00
Red	#FF0000
Silver	#E6E8FA
White	#FFFFFF
Yellow	#FFFF00

Table 4-4: RGB codes

¹⁵ RGB stands for red, green, blue.

Exercise 4-8: Adding a Background Pattern

1. Switch applications to your text editor.
2. Edit the <BODY> tag script at the top of your HTML document with the following script:

```
<HEAD>
<TITLE><your name's> Practice Web Page</TITLE>
</HEAD>

<BODY BACKGROUND=whittile.jpg>
```

3. Save the HTML document.
4. Switch applications to your Web browser.
5. Reload the Web page.
6. Compare the Web page with Figure 4-10. The background pattern should appear. If not, repeat the steps of this exercise, taking care to accurately type the script in Step 2.

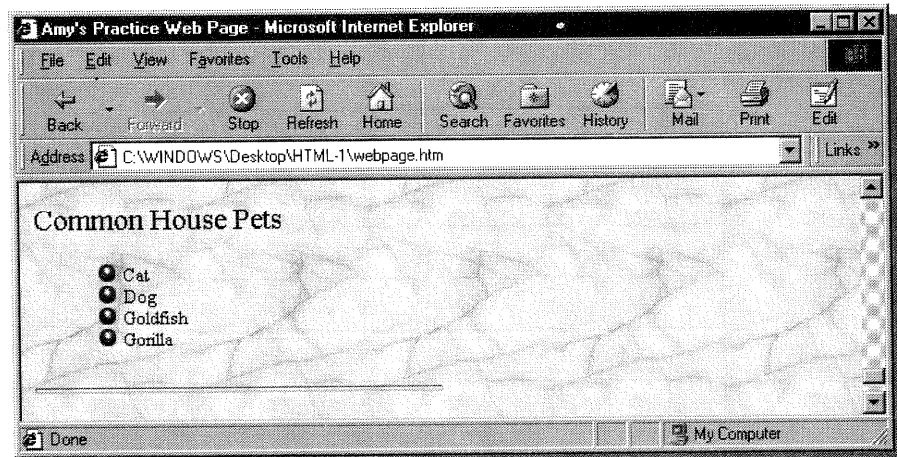


Figure 4-10: BACKGROUND attribute applied to the <BODY> tag

Exercise 4-9: Adding a Background Color

1. Switch applications to your text editor.
2. Edit the <BODY> tag script you typed in the previous exercise with the following script:

```
<HEAD>  
<TITLE><your name's> Practice Web Page</TITLE>  
</HEAD>  
  
<BODY BGCOLOR=#4F4F2F>
```

3. Save the HTML document.
4. Switch applications to your Web browser.
5. Reload the Web page.
6. Compare the Web page with Figure 4-11. You should see a dark olive green background color. If not, repeat the steps of this exercise, taking care to accurately type the script in Step 2.

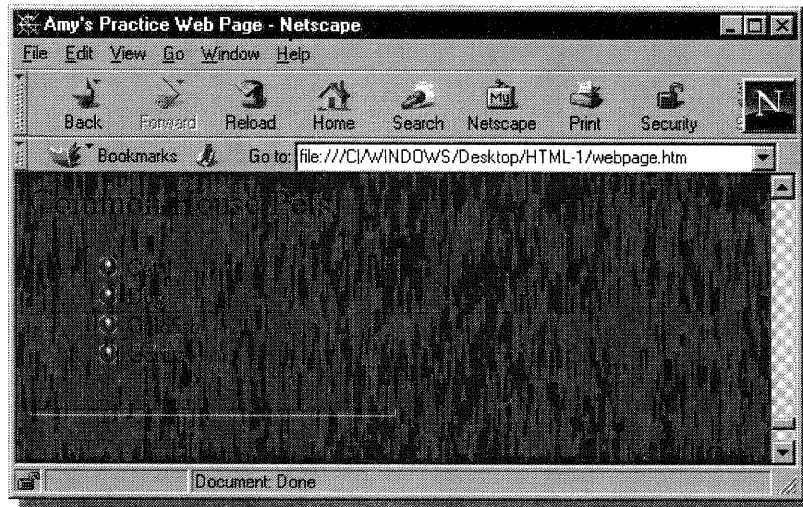


Figure 4-11: Poor contrast between background color and default body text

Exercise 4-10: Changing Text Color

1. Switch applications to your text editor.
2. Edit the <BODY> tag script you typed in THE previous exercise with the following script:

```
<HEAD>
<TITLE><your name's> Practice Web Page</TITLE>
</HEAD>

<BODY BGCOLOR=#4F4F2F TEXT=#FFFFFF>
```

3. Save the HTML document.
4. Switch applications to your Web browser.
5. Reload the Web page.
6. Compare the Web page with Figure 4-12. You should notice that the text is now white and has contrast against the dark background. If not, repeat the steps of this exercise, taking care to accurately type the script in Step 2.

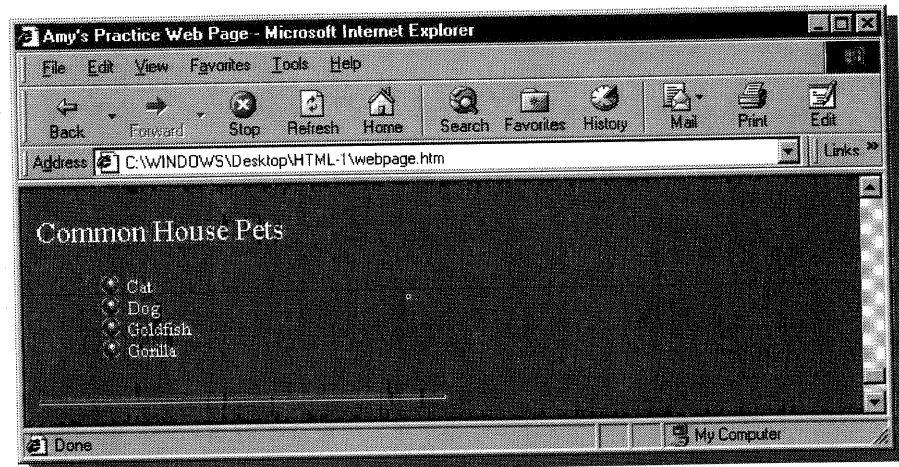


Figure 4-12: Text color changed with TEXT attribute in the <BODY> tag

7. Remove the BGCOLOR and TEXT attributes from the <BODY> tag. This will return the text color to the default black and the background color to the default white.

Lesson 4 Summary

- ▶ The Image tag, ``, is used to incorporate an image into a Web page.
- ▶ Web browsers support two image file formats: GIF and JPEG.
- ▶ Image files are separate from an HTML document. The `` tag simply instructs a browser to locate, download, and properly display an image within a Web page.
- ▶ The `` tag has various attributes, one of the most significant being `ALIGN`. `VSPACE` and `HSPACE` are also useful for configuring text and images beside each other.
- ▶ Small images that resemble bullets or icons may be employed in place of an unordered list (`` tag). They add a colorful, multimedia flair to a Web page.
- ▶ Various `` tag attributes, especially the `HSPACE` attribute, may be used to refine a bullet list. Use of the `<BLOCKQUOTE>` tag will indent the list.
- ▶ GIF and JPEG images may be used to specify background patterns on Web pages. The image files are laid out as an overall pattern via a method called *tiling*. The tiling scheme is determined by the browser.
- ▶ An attribute, not a tag, designates an image as a background pattern. The `BACKGROUND` attribute to the `<BODY>` tag allows this.
- ▶ A solid color, rather than an image, may be specified as a background in Web pages. The background color is specified with the `BGColor` attribute to the `<BODY>` tag.
- ▶ Text color may be changed by adding the `TEXT` attribute to the `<BODY>` tag. This is especially useful when the background color or pattern is dark and contrasts poorly with the default black body text.
- ▶ Both text and background colors are specified using a six-digit RGB (red, green, blue) color. The same RGB colors are used for both background colors and text colors. The RGB code is preceded by a pound sign (#). White, for example, is specified as `#FFFFFF`.